

Remarks

Claims 1-9, and 11-21 were pending.

Claims 1, 4, 6, 8, 12 and 15 are amended.

Claims 3, 9 and 20 are cancelled.

Claims 22-24 are new.

Claims 2, 5, 7, 11, 13, 14, 16-19 and 21 are as previously presented.

The application now contains claims 1, 2, 4-8, 11-19 and 21-24.

Claim 1 is amended for clarity by inserting the phrase "in a non-oxidising atmosphere" at the end of line 1 immediately following " $\text{TiO}_2/\text{SiO}_y$ " and by inserting the phrase "a platelet-shaped pigment obtained by calcining a" immediately following " $0.03 \leq y \leq 1.95$, or". Claim 1 is further amended to delete the term "metal" in the following line, insert "coated Ti, Zr, Cr, or Zn platelet" in its stead and to insert the limitation "at a temperature of more than 600°C " at the end of the claim. Support is found in claims 1 and 8.

Claim 4 is amended for clarity to specify that component (a) is a multi-layered substrate layer which can be one of 4 possible constructions. Support is inherent in the claim.

Claim 6 is amended to delete the word "either" from line 1. Claim 15 is amended to delete the word "component" from line 2.

Claim 8 is amended to delete the phrase "according to claim 1" in line 1, to delete the word "metal" from line 2 inserting in its place "Ti, Zr, Cr, or Zn" and by deleting the optional step (b). Support is found in original claim 1.

Claim 12 is amended to delete the all material following "wherein $0.70 \leq y \leq 1.8$ ".

Claims 22-24 are added to reclaim material deleted from claims 8, 9 and 20.

No new matter is added.

Rejections

Claim 4 is rejected under 35 USC 112 second paragraph for not being clear as to whether component (a) contains all the substrate layers listed or if only one of the options is present. Claim 4 has been amended to specify that each of the constructions for the multi-layered platelet-shaped substrate layer are listed in the alternate and that the pigment is required to comprise one such layer (a) coated with layers (b) and (c). Applicants note that layers in addition to a, b and c are not excluded.

Claims 8, 9, 20 and 21 rejected under 35 USC 112 second paragraph. Applicants believe that the above amendments clarify the issues in that the optional material has been deleted from claim 8, claim 9 has been deleted, and that new claims 22 and 24 specify that step a occurs first and then step b.

Applicants therefore respectfully submit that the rejections under 35 USC 112 second paragraph are addressed and are overcome and kindly ask that they be withdrawn.

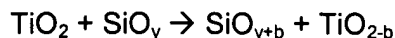
Claims 1-7 and 11-21 are rejected under 35 USC 102(e) as being anticipated by US 6,569,529 which discloses a pigment containing of a core of a dielectric material and Ti-based absorber layers.

Applicants respectfully traverse the rejections.

The material of the Ti-based absorber layers of '529 is substantially free of titanium dioxide and can be composed of elemental titanium, titanium-based alloys, titanium-based compounds, or mixtures thereof. Examples of suitable titanium-based alloys include titanium mixed with carbon (Ti/C), titanium mixed with tungsten (Ti/W), titanium mixed with niobium (Ti/Nb), titanium mixed with silicon (Ti/Si), and combinations thereof. Examples of suitable titanium-based compounds include titanium nitride (TiN), titanium oxynitride (TiN_xO_y), titanium carbide (TiC), titanium nitride carbide (TiN_xC_z), titanium oxynitride carbide ($\text{TiN}_x\text{O}_y\text{C}_z$), titanium silicide (TiSi_2), titanium diboride (TiB_2), and combinations thereof. Column 8 lines 37-59.

Absent from '529 is any mention of a calcining step.

The pigments of the instant invention have a layer obtained by calcining $\text{TiO}_2/\text{SiO}_y$ in a non-oxidising atmosphere. It is assumed that the principle according to the invention is based on producing, by reduction of TiO_2 with SiO_y , an intermediate layer that causes a change in the refractive index.



The Action states in the paragraph at the bottom of page 6 that the instant pigments are a 'product by process' and it should be demonstrated that the product thus produced is different from similar products produced via a different process. Applicants respectfully point to the Examples on page 26 and 27 of the instant specification which demonstrate the impact of calcination on the color of the pigment when viewed at different angles.

The calcination reaction takes place at the interface of the TiO_2 and SiO_y portions of the pigment and this is expected to be present in very thin, intermediate layer. Neither SiO_{y+b} nor TiO_{2-b} , the result of the calcination step, are mentioned as components of the titanium-based absorber layers of '529. Further, there is no mention of calcination of any layers in '529 which Applicants have shown result in significantly altering the pigment (Examples 1 and 2). Applicants therefore submit that the subject matter of the instant application is not anticipated, nor suggested by, '529.

Applicants respectfully submit that the above discussion and the data of record in the specification clearly demonstrate that calcination as described in the instant claims results in a substantially different product and is an important feature of the instant pigments. As such a product is not found in the disclosure of US 6,569,529 Applicants respectfully submit that the 35 USC 102(e) rejections over US 6,569,529 are overcome and kindly ask that they be withdrawn.

Claims 1, 3, 8, 9, 11, 12, 20 and 21 are rejected under 35 USC 102(b) as being anticipated by US 4,978,394 which discloses pigments prepared by calcining TiO_2 coated aluminum.

Applicants respectfully traverse the rejections.

Applicants respectfully note that the pigments of '394 are prepared by coating aluminum with TiO_2 followed by calcining. In light of the amendments above, none of Applicants instantly amended claims relate to an aluminium pigment coated with a TiO_2 layer or a calcined TiO_2 layer.

Applicants further respectfully note that while additional layers may be present in the pigments of '394, there is no mention of calcining TiO_2 which is in contact with a SiO_x layer. Rather, the partial reduction of the TiO_2 coating of the TiO_2 coated Al pigments of '529 can be effected with H_2 , CO , hydrocarbons or in particular ammonia at from 400 to 900°C. Any additional layers would be added to this already calcined layer. As TiO_2 is not calcined in contact with SiO_y , as in the instant invention, the pigments of '394 do not have the instant intermediate layer comprising $\text{SiO}_{y+b} + \text{TiO}_{2-b}$.

In light of the above amendments and discussion, Applicants respectfully submit that the 35 USC 102(b) rejections over US 4,978,394 are overcome and kindly ask that they be withdrawn.

Claims 1-9 and 11-21 are rejected under 35 USC 103(a) as obvious over US 5,569,529 in view of US 4,978,394. The Action suggests that performing the calcination of '394 on the pigments of '529 provides the instant invention.

Applicants respectfully traverse the rejections.

Applicants respectfully note that US 4,978,394 does not disclose calcining either $\text{TiO}_2/\text{SiO}_y$ or TiO_2 coated Ti, Zr, Cr, or Zn. Further, while '529 does disclose pigments wherein a Ti absorber layer is in contact with a silicon oxide layer, the Ti absorber layer of '529 is "essentially free of Titanium dioxide", column 8, line 40 of '529.

The pigments according to the invention are characterized by a high gloss and a very uniform thickness, as a result of which very high colour purity and colour strength are obtained. Reference is made to Example 1 of the instant invention, wherein a sample of $\text{TiO}_2/\text{SiO}/\text{TiO}_2$ is heated in a nitrogen atmosphere for 2 hours at 550°C. It is apparent from Figure 1 that calcining causes a change in the reflection maximum, but not in the reflection minimum, which points to a change in the refractive index at the TiO_2/SiO interface, which is presumably due to the reduction of TiO_2 by SiO .

As there is no suggestion in the art to calcinate a bi-layer system of two metal oxides in a non-oxidising atmosphere, Applicants respectfully aver that the effect shown in instant Figure 1 can not be gleaned from the combination of art.

As '529 disclose pigments wherein a Ti absorber layer "essentially free of Titanium dioxide" in contact with a silicon oxide layer, Applicants respectfully aver that applying a generic calcining step as in US 4,978,394 to the pigments of '529 could provide the elements leading to the pigments displaying the effect of instant Figure 1. Applicants also respectfully aver that in light of the amendments above, any combination of the cited art fails to meet the instant limitations.

Applicants believe that they have demonstrated in the discussion above and in the instant specification that the instant calcination step generates a new and different pigment with structures and properties that are not found in, or suggested by, the existing art. Applicants further submit that any need that may be present to combine the pigments of one piece of art with a calcination step from other piece of art suggests that the calcination is likely to create new product with the potential for novel effects. It is Applicants position that such novel products and unpredictable effects is what has been discovered and presented in the instant application.

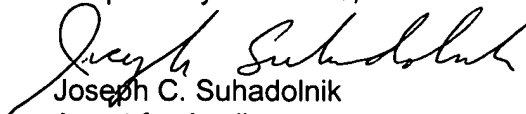
Applicants therefore respectfully submit that the 35 USC 103(a) rejections over US 6,569,529 in view of US 4,978,394 are overcome and kindly ask that they be withdrawn.

Claims 1-9 and 11-21 are also rejected on the ground of non-statutory obviousness-type double patenting over each of US Pat 7,291,216 and US Appl. No. 10/531,483. Applicants will submit the appropriate terminal disclaimers upon the resolution of all remaining issues.

Applicants respectfully submit that all other rejections are addressed and are overcome and kindly ask that they be withdrawn and that upon submission of the relevant terminal disclaimers, claims 1, 2, 4-8, 11-19 and 21-24 be found allowable. In the event that minor amendments will further prosecution, Applicants request that the examiner contact the undersigned representative.

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